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INVESTOR IN PEOPLE

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NP10 8QQ

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Request for grant of a patent

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The Patent Office

Cardiff Road
Newport
Gwent NP9 1RH

1. Your reference

DM/HSo/P10140GB

15 NOV 1999

2. Patent application number

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9927002.7

16NOV99 E492099-5 003312

F01/7700 0.00-9927002.7

3. Full name, address and postcode of the or of each applicant (underline all surnames)

KEYCORP (EMEA) LIMITED
ST. JAMES COURT
WILDERSPOOL CAUSEWAY
WARRINGTON. WA4 6PS

Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

77800 42001

4. Title of the invention

MULTIPLE SCHEME ELECTRONIC CASH
SYSTEM

5. Name of your agent (if you have one)

"Address for service" in the United Kingdom
to which all correspondence should be sent
(including the postcode)

CRUIKSHANK & FAIRWEATHER
19 ROYAL EXCHANGE SQUARE
GLASGOW
G1 3AE

Patents ADP number (if you know it)

547002

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number
(if you know it)

Date of filing
(day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing
(day / month / year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

- a) any applicant named in part 3 is not an inventor, or
 - b) there is an inventor who is not named as an applicant, or
 - c) any named applicant is a corporate body.
- See note (d))

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Claim(s) -

Abstract -

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Statement of inventorship and right to grant of a patent (Patents Form 7/77) 1

Request for preliminary examination and search (Patents Form 9/77) -

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Any other documents (please specify) -

11. I/We request the grant of a patent on the basis of this application.

Signature

Date

198

CRUIKSHANK & FAIRWEATHER 15 NOVEMBER

12. Name and daytime telephone number of person to contact in the United Kingdom

DR DAVID MORELAND 0141 221 5767

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MULTIPLE SCHEME ELECTRONIC CASH SYSTEMTECHNICAL FIELD

The present invention relates to smart cards, and in particular, though not exclusively, to smart cards which, either solely or in conjunction with other purposes, are used to provide electronic cash services.

5

BACKGROUND ART

The present application is related to Australian Patent Application number PP 7248 of 20 November 1998 by Keycorp Limited.

10

It is now envisaged that the provision of the escrow purse of AU PP 7248 could be employed to address other problems relating to the provision and payment of any service where it is difficult to go 'on-line' to a payment network at the time of the service purchase.

15

Take for example, 'pay as you talk' class debit mobile phone service provision, eg. available in the United Kingdom. The most popular method of payment is to purchase paper "scratch cards" which contain "one time top up" authentication codes. These codes are entered into a telephone handset via a keypad and then can be transmitted to a central server where a 'meter/tariff' account resides either on the handset or all on a central server that controls the access times for each particular handset.

20

A key disadvantage with scratch cards is the cost of

distribution, which represents a significant percentage of the telecom operator's gross revenue (typically - 15%-20%). For mobile phone network operators this can run into many millions of pounds per year.

5 Mobile handsets with a smartcard interface (slot) specifically to communicate with card based applications that can perform the authentication 'top up' function and provide payment are known. The method for payment is presently considered to be for the handset to 'go on-line'

10 and transfer funds either by authorizing a credit or debit transaction from a cardholder's bank account to the telecom network operator directly, or to transfer funds directly in the case of e-cash from a handset connected smartcard to a central server.

15 Considering the Mondex™ E-cash scheme. As all Mondex™ value transfers must occur between two Mondex™ Purse software applications, using Mondex™ for e-payment over mobile phone networks such as GSM, requires a suitable data channel. In the case of GSM the only such data channel

20 available (without adding more expensive modern adaptation circuits to each handset) is GSM's Short Messaging Service (SMS). SMS is very low bandwidth and is "non-isochronous packet network like" in behaviour. This gives very poor performance for a point to point transaction such as a

25 Mondex™ transfer resulting in long transaction times and unreliability.

A further problem is the cost associated with revenue collection, eg. from parking meters or the like.

A yet further problem is incompatibility with non same scheme purses.

SUMMARY OF THE INVENTION

5 According to the improvement there is provided a service provision method comprising the steps of:

- (a) presenting a smart card (eg. as disclosed in AU PP 7248) to at least one service access point;
- (b) undertaking mutual authentication of the smart card
10 and the access point;
- (c) the access point communicating the required tariff to a ledger of the smart card;
- (d) the ledger establishing whether sufficient funds are held in a card holder purse;
- 15 (e) transferring funds from the user purse to an escrow purse, ie. purchasing the service, optionally at the users control;
- (f) updating the ledger by recordal of transfer of funds to the escrow purse and service provider ID to the
20 ledger.

Optionally between steps (b) and (c) a tariff may be established by the access point - eg. in the case of different tariffs for different users, eg. concession parking.

25 Optionally between steps (b) and (c) the user may select the service to be provided. For example, the user may select the required parking time or in the case of cinemas/theatre the film/show to be attended.

The service may be selected from one of: parking, ticket issuance (eg. transport/event ticketing), phone service (eg. mobile phones), pay phones and area access (eg. museums, visitor attractions or the like).

5 The improvement thus provides a deferred payment method.

Preferably, there may be a plurality of interfaces on the smart card each for use with a distinct access point.

10 The improvement may be adapted to the field of information content provision, eg: downloading of information from a webserver, ie. in buying of pages of information.

15 It is envisaged that a user may purchase, eg. via the Internet, small value information content from an information provider up to a predetermined value, once the predetermined value having been reached the funds being transferred from the escrow purse to the provider either on-line or eg. via a banking machine at a suitable time.

20 BRIEF DESCRIPTION OF THE DRAWINGS

An embodiment of the present invention will now be described by way of example only, with reference to the accompanying drawing, which is:

25 Fig. 1 is a schematic view of an architecture of a smart card for use in the present invention.

DETAILED DESCRIPTION

Referring to Fig. 1 there is illustrated a smart card,

generally designated 10a of substantially similar architecture to the smart card 10 of AU PP 7248 of 20 November 1998, like parts being identified by like numerals, but suffixed 'a'.

5 The improvement provides a service provision method comprising the steps of:

- (a) presenting the smart card 10a to at least one service access point 100a;
- (b) undertaking mutual authentication of the smart card
10 10a and the access point 100a, in a way known in the art;
- (c) the access point 100a communicating a required tariff to the ledger 15a;
- (d) the ledger 15a establishing whether sufficient funds
15 are held in a card holder purse 11a;
- (e) transferring funds from the user purse 11a to the escrow purse 12a, ie. purchasing the service, optionally at the user control;
- (f) updating the ledger 15a by recordal of transfer of
20 funds to the escrow purse 12a and service provider ID in the ledger 15a.

The improvement thus allows for payment to be 'deferred'.

25 Considering particularly pre-pay mobile phones, and funds collected later, under control of a "revenue collection body". The use of SMS' could, therefore, be greatly reduced by use of the improvement. The revenue collection body could use a server on the telecom network

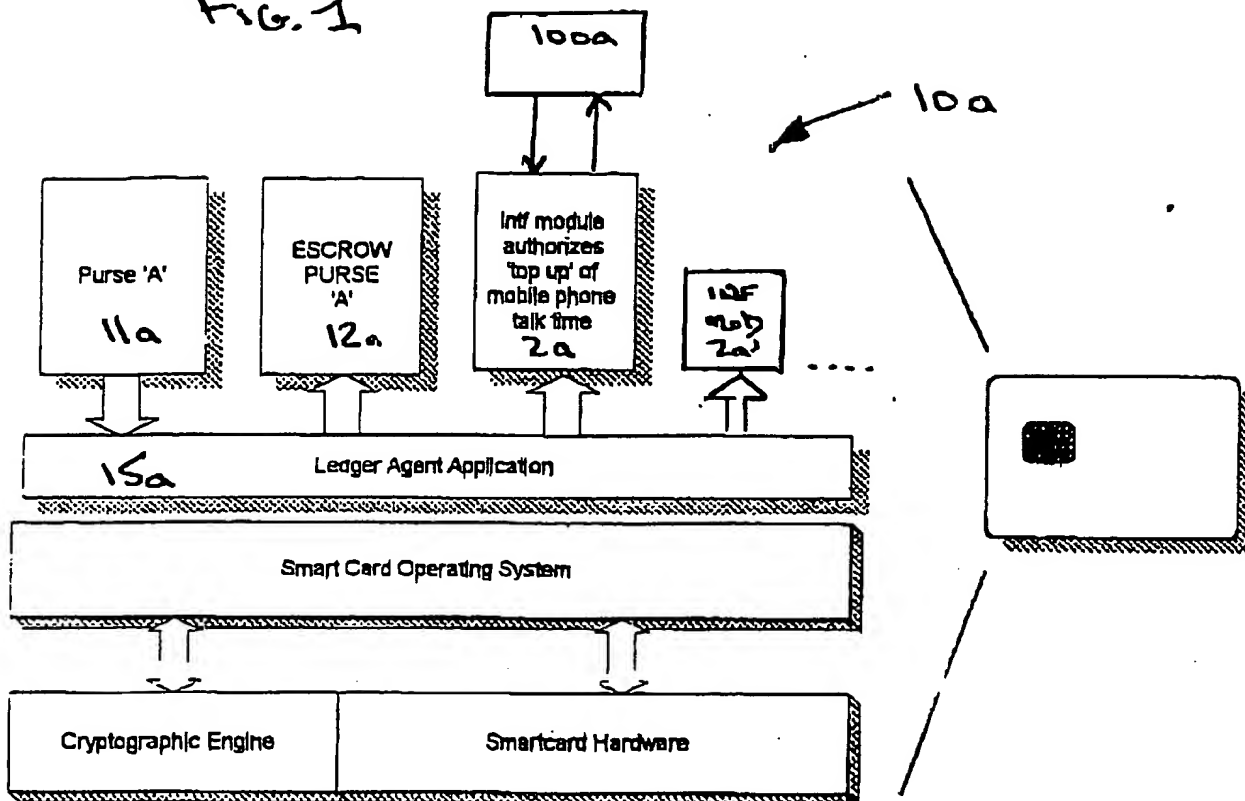
which 'pulls' the funds from the escrow purse via the SMS, transparent to the card holder/phone user, or simply when the card holder/phone user connects the smart card to the "revenue collection body" to access other services it provides. It is therefore envisaged that the 'revenue collection' function, ie. the emptying of the escrow purse, could be performed by the same bank that issued the payment smartcard.

Another application could be where card 10a based software application 'Intf Module' (2a) (see Fig. 1) that is controlled by the 'Ledger Agent application' (15a) (see Fig. 1) authorizes some other service provision point such as a ticket turnstile at a theatre, on a public transport vehicle or even a parking or utility meter.

This allows the service provision point to be completely 'off-line' obviating the need and cost of networking. Again the revenue collection function would occur after the fact, and other 'service token' reconciliation functions could be included in the Intf Module (2a) application.



Fig. 1



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